Doctors Across Borders t/a DOCTORS BEYOND Medicine

DMSO

Back

What is DMSO?

Dimethyl Sulfoxide (DMSO) was first synthesized in 1866, has been available as a by-product of the paper pulp industry for many years, and is now used chiefly as an industrial solvent. In 1964 Dr. Stanley W. Jacob, et al. first described the remarkable medicinal properties of DMSO. When applied to intact human skin, the compound penetrates rapidly and produces a wide range of pharmacologic actions, including anti-inflammation, local analgesia, bacteriostasis, diuresis, cholinesterase inhibition, enhancement of the action of concomitantly administered drugs, influence on collagen, nonspecific enhancement of immunity, vasodilation, and lessening of adhesiveness of blood platelets. As a result the compound has been used widely as a treatment for various conditions, including arthritis, bursitis, acute musculoskeletal trauma, scleroderma, troublesome urogenital disorders, and various postoperative pain syndromes. To date little, if any, local or systemic toxicity has been noted in humans after the administration of DMSO.

How does DMSO work?

Research suggests the eight primary pharmacologic actions of Dimethyl Sulfoxide are:

- Penetrant-carrier: Experiments utilizing the intact urinary bladder of the dog have demonstrated that DMSO enhances the absorption of heparin, insulin, sodium salicylate, Evan's blue dye, sulfadiazine, aminophylline, and ThioTEPA.
- Local analgesic agent: Dimethylsulfoxide has been shown to penetrate human skin, relieving pain in a variety of conditions. In the laboratory, it blocks conduction in isolated nerves. Conduction returns when the isolated nerve is washed free of Dimethyl Sulfoxide.
- Anti-inflammatory adjunct: DMSO has anti-inflammatory activity against the bakers yeast granuloma in guinea pigs.
- Bacteriostatic agent: DMSO is bacteriostatic in 20 percent concentration against E. coli, Staphylococcus aureus, and Pseudomonas.
- Diuretic: The intravenous administration of DMSO to dogs produces a transient doubling of urine volume.
- Tranquilizer: The material has been shown clinically to exert a tranquilizing effect when applied topically.
- Potentiator of other compounds: Experimental work in the laboratory has shown that DMSO-insulin combinations administered intravenously to dogs give a blood sugar drop that is more profound and of longer duration than when insulin alone is administered.
- Hydroxyl radical scavenger: DMSO is the most powerful OH free radical scavenger in biology.

In 1866, Russian scientist Alexander Saytzeff isolated a most curious and peculiar chemical compound. It was crystalline, odor-less, non-toxic and had a garlic-like taste when consumed. At the time, Saytzeff had no way to predict that his discovery was going to prove highly controversial throughout its entire medical history, that it was going to be tested in thousands of studies and provide miraculous relief for numerous patients.

I'm talking here about *dimethyl sulfoxide* (**DMSO**), an organic sulfur compound which was used only as an industrial solvent, that is, until its medical properties were discovered in 1963 by a research team headed by Stanley W. Jacob, MD.

DMSO is a by-product of kraft pulping (the 'sulfate process') which converts wood into wood pulp leaving almost pure cellulose fibers. As industrial as it may sound, the process simply entails a treatment of wood chips with a mixture of sodium hydroxide and sodium sulfide, known as white liquor, breaking the bonds which link lignin (from the Latin word lignum, meaning wood) to the cellulose.

DMSO is useful as a pain reliever and also in burns, acne, arthritis, mental retardation, strokes, amyloidosis, head injury, scleroderma, it soothes toothaches, eases headaches, hemorroids, muscle strains, it prevents paralysis from spinal-chord injuries and softens scar tissues.

In fact, it is useful in well over 300 ailments and is safe to use. You might think that a compound that has so many alleged uses and benefits should be automatically suspect, so let's have a close look at its properties and the data available and we'll shed some light in this miraculous chemical.

Sulphur: The Stuff of Life

DMSO is an intermediate product of the global Sulfur Cycle which distributes bioavailable sulfur for all animal and plant life (Parcell, 2002). Sulfur compounds are found in all body cells and are indispensable for life, they are needed for a number of chemical reactions involved in the detoxification of drugs and other harmful toxins, and they have potential clinical applications in the treatment of a number of conditions such as depression, fibromyalgia, arthritis, interstitial cystitis, athletic injuries, congestive heart failure, diabetes, **cancer, and AIDS**.
(Parcell, 2002).

Among the sulfur compounds, **DMSO** is probably the one that has the widest range and greatest number of therapeutic applications ever shown for any other single chemical. It has around 40 pharmacological properties that may be beneficial in the prevention, relief or reversal of numerous diseases.
(Morton, 1993).

Someone complained to Dr. Jacob of a splitting headache and gave him permission to apply some DMSO after hearing of its capabilities. The headache was gone in minutes, came back in four hours, and left for good after DMSO was applied a second time. Used for one purpose, sometimes it did another; put on a cold sore, within a few hours it cleared up a woman's sinusitis.

A woman who had had a stroke found after DMSO was painted on her painful jaw that she could now write with her paralyzed hand and could walk better.
(Haley, 2000)

Therapeutic Properties

- **DMSO** is an effective pain killer, blocking nerve conduction fibers that produce pain. It reduces inflammation and swelling by reducing inflammatory chemicals. It improves blood supply to an area of injury by dilating blood vessels and increasing delivery of oxygen and by reducing blood platelet stickiness. It stimulates healing, which is a key to its usefulness in any condition.
- It is among the most potent free radical scavengers known to man, if not the most potent one. This is a crucial mechanism since some molecules in our bodies produce an unequal number of electrons and the instability of the number causes them to destroy other cells.
- **DMSO** hooks on to those molecules and they are then expelled from the body with the DMSO.
- **DMSO** also penetrates the skin and the blood-brain barrier with ease, penetrating tissues, and entering the bloodstream. Furthermore, DMSO protects the cells from mechanical damage and less of it is needed to achieve results as time passes as opposed to most pharmaceuticals where increasing doses are required.
- It has a calming effect in the central nervous system and it reaches all areas of the body, when absorbed through the skin, including the brain. That is, DMSO applied to one area often leads to pain relief in some other location due to its systemic effect.
- It acts as a carrier for other substances or drugs and it also potentiates their effect. In fact, certain drugs dissolved in DMSO, such as corticoids, antibiotics and insulin, may be used in a lower dose than usual without reducing their therapeutic efficacy and in addition, their undesirable side effects are greatly diminished.
- Also, drugs are able to pass through the blood-brain barrier which is usually impenetrable.
- **DMSO** promotes the excretion of urine and functions as a muscle relaxant. It boosts the immune system, increasing the production of white cells and macrophages that destroy foreign material and pathogens in the body. It also has anti-bacterial, anti-viral and anti-fungal properties. DMSO also increases the permeability of cell membranes, allowing a flushing of toxins from the cell.
- **DMSO** has radioprotective properties against lethal and mutagenic effects of X-rays in cells, cellular systems and whole animals. It also has cryoprotective properties, meaning that it is capable of protecting against injury due to freezing.
- **DMSO** has also been shown to have cholinesterase properties (Sams, 1967), in other words, it inhibits an enzyme from breaking down acetylcholine, increasing both the level and duration of action of this important neurotransmitter. Acetylcholine is responsible for learning and memory and is also calming and relaxing.
- Acetylcholine is also a major factor in regulating the immune system, acting as a major brake on inflammation in the body.As a source of sulfur, DMSO aids in heavy metal detoxification. Sulfur binds with toxic heavy metals (mercury, lead, aluminum, cadmium, arsenic, nickel) and eliminates them via urination, defecation and sweating.

FDA and Big Pharma Obstacles

DMSO is sold in health food stores, mail-order outlets, on the Internet, and in most countries around the world. It is used by millions for its health benefits yet in the U.S., DMSO has FDA approval only as a preservative of stem cells, bone marrow cells, and organs for transplant, and for interstitial cystitis - a painful inflammatory condition of the bladder which is very difficult to treat with other therapies.

That DMSO has not found favor as a remedy for other medical conditions is partly due to the inability to test it in double-blind experiments. Blind studies, as the name suggests, requires that a study be done without knowing which patient is taking the placebo or the drug.

In the case of the DMSO, a blind study is impossible since the peculiar garlic-like taste and smell (no matter the route of application) gives it away and no satisfactory placebo could be devised that would mimic this particular effect of DMSO. (Steinberg, 1967).

The FDA and 'big pharma' would prefer we remain dependent on their drugs.

If you search for DMSO on the U.S. National Library of Medicine (pubmed.gov), you'll get almost 30,000 indexed results, making it one of the most studied compounds of our time. Yet, we are led to believe that DMSO can't pass the required regulations for its approval in other medical conditions even though its effectiveness and low toxicity profile is unquestionable.

You see, **DMSO** is a common chemical that can be manufactured cheaply. No drug company can get an exclusive patent since it is also a natural compound, therefore there is no significant financial return.

In fact, an executive of a major drug company is quoted as saying, "I don't care if DMSO is the major drug of our century and we all know it is, it isn't worth it to us" [CBS TV show 60 minutes with Mike Wallace, The Riddle of DMSO]. If DMSO were to be approved by the FDA, it would be competetive and drug companies would be unable to hold the patents.

In the words of the director of the Bureau of Drugs of the FDA, J. Richard Crout, M.D., "DMSO is a low toxicity and safe compound (...) I think that it is a fact of life that drug companies are not going to invest in something unless they think there is some financial return" [CBS TV show *60 minutes* with Mike Wallace, *The Riddle of DMSO*].

Despite restrictions on the use of DMSO, thousands of Americans purchase it on the 'black market' each year, its popularity due not to publicity, but rather 'word of mouth'. When you have something that relieves all kinds of ailments, including some life-threatening ones, people naturally recommend it to friends and family!

In Perspective

In the 1960s, research with DMSO on humans was temporarily halted after certain animals treated with DMSO were found to have changes in the eye lens. Some of these changes resembled those seen in aging dogs (Gordon, 1967), but nevertheless, research was gradually restarted after no evidence was found of eye changes in humans.

As Daniel Haley reports in his book Politics in Healing: "*Tests in rabbits, dogs, and pigs (but not humans) had shown some problems. When quantities of DMSO equal to about ten times the maximum human dose were given every day over a period of six months, slight changes in the lenses of the animals' eyes would result, enough to produce a slight nearsightedness.*

The lens changes were not enough to cause dogs difficulty when running - they didn't bump into things - and in some cases, the changes disappeared after the massive DMSO doses were stopped. In no test at that time or since has DMSO ever caused cataracts, either in animals or in humans".
(Haley, 2000).

In fact, **DMSO** is effective for macular degeneration and retinal disease, both diseases of the eye. This effectiveness was first discovered when patients with retinitis pigmentosa, a retinal disease, were taking DMSO for certain musculoskeleteal disorders. They sensed that their vision had improved and some had remarkable results.
(Morton, 1993).

As far as eyes are concerned, the evidence on DMSO is quite to the contrary. When several patients treated with DMSO for muscular problems reported to Dr. Jacob that their vision had improved, he sent them to Dr. Robert O. Hill, ophthalmologist at the University of Oregon Medical School.

Confirming the favorable changes, Dr. Hill began his own experiments with DMSO (after it was known that the lens changes did not happen in humans). His research showed drops of 50% DMSO to be effective in retinitis pigmentosa and macular degeneration, and presented a report on this at the New York Academy of Sciences symposium in 1971.
(Haley, 2000).

In contrast, the number of medication-related deaths in the U.S. is estimated at over 200,000 a year, making medications the third or fourth leading cause of death.
(Pezzalla, 2005).

Even common pain relievers called NSAIDs, examples of which include Advil, Motrin, Aleve and aspirin, account for an estimated 7,600 deaths and 76,000 hospitalizations in the U.S. every year.
(Tamblyn et al, 1997).

Taking this into consideration, it is safe to declare that DMSO is among the safest substances in the world today. In fact, the classic test for toxicity - the LD-50 test - measures the lethal dose (LD) at which half of a group of test animals is killed. The LD-50 tests for aspirin and DMSO show that aspirin is seven times more toxic than DMSO.
(Haley, 2000).

Quick Guide and Ailments

- **DMSO** is generally applied to the skin in a gel, cream, or liquid. It can be taken by mouth or as an intravenous injection, in many cases along with other drugs. It has also been administered subcutaneously, intramuscularly, intraperitoneally, intrathecally, by inhalation, instilled into the eye, on the mucous membranes, and into the urinary bladder. Strengths and dosages vary widely.
- If you are just dealing with pain or an injury, use a topical application. Don't drink it. Drinking it is for serious detoxing and other internal necessities. If you use a rose scented DMSO cream, chances are that nobody will be able to smell DMSO's garlic-like smell.
- ***The usual oral dose of DMSO is one teaspoon per day of DMSO 70%.***
  (Morton, 1993).
- But since it can trigger detoxification reactions and DMSO's total excretion from the body can take several days, it is best to do it only once a week.
  Start with half a teaspoon of DMSO 50% and increase to a teaspoon of DMSO 70% only if any possible detoxification reaction is well tolerated.
- When you use liquid DMSO on the skin, let it dry for over 20 to 30 minutes before wiping the rest out. The skin must be clean, dry, and unbroken for any topical use of DMSO.
- The face and the neck are more sensitive to DMSO and no higher concentrations than 50% should be applied there. Topical concentrations of DMSO should be kept below 70% in areas where there is a reduction of circulation.
- When 60 to 90% DMSO is applied to the skin, warmth, redness, itching, and sometimes local hives may occur. This usually disappears within a couple of hours and using natural aloe vera, gel or cream, will help counteract or prevent this effect.
- When 60 to 90% DMSO is applied to the palm on the hand, the skin may wrinkle and stay that way for several days.

"My brother put some DMSO gel (70% dmso, 30% aloe vera) on his shoulders and lower part of neck because he had muscle pain/soreness in that area, and it caused skin redness/irritation for a few hours, although it did diminish the muscle soreness as well... My grandma has rheumatoid arthritis that made her legs swell up and hurt continuously, and I had her apply the same DMSO gel, and after about 2-3 days of applying it once a day, the swelling was 90% gone, and I think within 4-5 days it was 100% gone, and she said the pain diminished as well".
Michael Shatskiy, Los Angeles, California, United States.

Chronic pain patients often have to apply the substance for 6 weeks before a change occurs, but many report relief to a degree that had not been able to obtain from any other source. In general, the greater the chronicity of the disorder, the longer the treatment with DMSO must be employed in order to achieve palliation.
(Steinberg , 1967).

Common health problems for which people will apply topical DMSO at home include acute musculoskeletal injuries and inflammations. The earlier DMSO is used, the more dramatic the result. A 70% concentration of DMSO mixed with water in volumes ranging from 8 to 12 ml, applied on and around the injury in a wide area at least three times daily, will have a healing affect in 4 out ot 5 people.

Arthritis, Sprains, Strains

It provides rapid amelioriation of pain and increased mobility and reduction of inflammation when used topically. You can see a positive response within 5 to 20 minutes and usually lasting for 4 to 6 hours. (Steinberg, 1967).

"Applying DMSO where it hurt to a six-year-old wasted from rheumatoid arthritis, in a half hour the child could move her shoulder and turn her head for the first time in two years. Persuaded to try walking, she managed a few steps and then burst into tears. "Why are you crying?" Dr Jacob asked her. "Because it doesn't hurt anymore", she replied. (Haley, 2000).

"My brother has arthritis of the spine. He is in pain and bedridden more than half the time. When he is treated with DMSO, he is able to lead a normal, active life... Just one application of this cheap, safe DMSO changed my brother from a grimacing patient into an active, pain-free man in exactly 30 minutes!". (Haley, 2000).

June Jones, once quarterback and later coach of the Atlanta Falcons pro-football team, had a bursitis calcification in his right shoulder. His career almost didn't happen as he could hardly lift his arm, let alone throw a football. But he was aware of DMSO and had used DMSO for sprains, like thousands of others. He received a shot of DMSO in the shoulder and after using DMSO for 30 days straight, the calcification disappeared. (Haley, 2000).

Stroke

Given soon after a stroke, DMSO can dissolve the clot that causes the stroke, restoring circulation and avoiding paralysis. Once DMSO gets into the body either daubed on the skin, given in I.V., or by mouth, it permeates the body and crosses the brain barrier, so even taken orally it can improve circulation. Ideally it should be I.V.

Even though DMSO 40% causes a prolongation of bleeding time, it is still indicated for use in treating embolic or hemorrhagic stroke. DMSO is superior to any other treatment for wounds to the brain where a great deal of bleeding is present. (Morton, 1993).

One man who had a stroke at 7:30 AM refused to go to the hospital until after his wife had spoken with Dr. Stanley Jacob, which didn't happen until 6:30 PM. Starting at 7 PM the day of the stroke, she gave him one ounce of 50% DMSO in a little orange juice every 15 minutes for two hours and then every half hour for two hours. The next day, her husband was better and soon returned to normal. A substance that can stop a stroke as it's happening is something many might want in their home medicine chest. (Haley, 2000).

Angina, Heart Attacks, Injuries of the Brain and Spinal Chord

DMSO may help neutralize harmful effects on the heart and brain in medical disorders involving the head and spinal chord injury, stroke, memory dysfunction, and ischemic heart disease (Jacob, de la Torre, 2009). A 40% DMSO solution should be administered within four hours to be effective, within ninety minutes is best.

After I.V. administration of DMSO, there is an elevation in the amount of spinal cord blood flow to the region of trauma. One of the first things that happens after spinal cord trauma is that a reduction of oxygen and blood flow sets in, inasmuch as the blood vessels constrict or shut down... Without some treatment, the tissue swells.

Eventually, this leads to paralysis. In a cerebral stroke, the animal will either become comatose or lethargic or die. With DMSO infusion immediately after injury (or stroke) all this is prevented.
Dr. Jack de Ia Torre, professor of physiology and neurosurgery at the University of New Mexico.

Dr. Stanley Jacob has even given DMSO intravenously to people who were already paralyzed - paraplegics - and some regained use of limbs. One man, quadraplegic, recovered enough to go through college and then to work in a bank. (Haley, 2000).

Infections

When combined with antibiotics, **DMSO** will convert bacteria which are resistant to a given antibiotic to being sensitive to that same antibiotic and probably a 80 to 90 per cent solution of DMSO will be required in order to be clinically useful (Pottz, Rampey, Benjamin,1967). DMSO has been used to transport antibiotics to hard-to-reach areas of the body with excellent results, such as the bone marrow and brain. (Sanders, 1967).

DMSO can dissolve a virus protein coating, leaving the virus core unprotected with its nucleic acid exposed to the immune system. Applied topically, it alleviates the lesions that occur as a result of Herpes Zoster, shingles. (Morton, 1993).

Placed into the nostrils or topically in the face, DMSO can open blocked sinuses within a few minutes and it has been used with sucess in patients with polyps. (Marvin, 1967).

DMSO can clear up gum disease and reduce tooth decay and their pain by painting it on the involved areas.

"I have some pharmaceutical grade DMSO and I pour about two teaspoons in a glass in the evening, put my 20 mg of doxycycline in it, add about 2 teaspoons of distilled water, and then swish it around in my mouth for about 2 or 3 minutes and then swallow it. So I guess it is about 50% solution. It's really working on my mouth. That inflamed area of my jaw has calmed down about 70% in just a couple of days. Or more, actually. I expect it to be completely soothed by tomorrow after tonight's dose of DMSO". L., Toulouse, France.

Keloids, Scars, Burns, Bruises

A concentration of 50 to 80% put on two or three times a day will flatten a raised scar after several months. It is of considerable value in superficial burns (Goldman, 1967) and when applied quickly to an injury, it can eliminate any bruising.

"I have been applying it to my face for two weeks... I had a bout of acne in March, and this healed the damage pretty well but what amazed me is that my hyperpigmentation (melasma) has also faded very noticeably. In fact, it's amazing!". HG, United States.

"I diluted a 50% solution and applied it topically to the inflamed lymph node. I applied it again this evening. I am totally amazed! There is a noticeable decrease in the size of the node, in just two applications! And it no longer feels matted. This node has been swollen for over 20 years!
Melissa Medlock, Coldwater, Michigan, USA.

Podiatry

DMSO can be effective in the treatment of painful corns, calluses, ingrown toenails, bunions, hammertoes, heel spurs, and the inflammation of gouty big toes.

Varicose veins and thrombophlebitis

Topical DMSO can whiten telangiectasias, small dilated blood vessels near the surface of the skin. It can also decrease the size of varicosities in the legs and the inflammation that goes with it, along with a relief of their cramping discomfort. (Marvin, 1967. Blumenthal, Fuchs, 1967).

Eye problems

One drop of a 25% DMSO solution (diluted in sterile physiologic or saline solution) once or twice per day is useful for eye problems, including cataracts or glaucoma.

"DMSO is amazing, I've also read various good results with using it in the eyes. Being the adventurous type myself, today I diluted DMSO down to 30% and put 2 drops in one of my eyes that has been having red spots around the iris. The red spots diminished drastically. The only side effect was a slight burning sensation, similar to those drops you get when one goes for a glaucoma test, without the side effect of dilated pupils". DZ, United States

Headaches

DMSO is highly effective in vascular headaches and in muscular tension which so often goes with headaches. It may be used on hairy areas such as the scalp and it also may be used near the eyes. A 90% solution is more effective. Ogden, 1967).

Mental Disorders

DMSO has been useful in the treatment of patients with the following diagnoses: (1) overexcited states (acute schizophrenic reactions, manic phase of the manic-depressive psychoses, alcoholic psychoses, symptomatic psychoses); (2) some symptoms of the chronic psychoses (autism, stereotypia, negativism, abnormal behavior or delusional states) ; (3) severe neuroses (anxiety reactions, obsessives). RamÃƒrez, Luza, 1967).

McGrady called special attention to an extraordinary paper presented by Dr. Eduardo Ramirez and Dr. SegisfredoLuza of the Ayetano Heredia University in Lima, Peru. After extensive tests on animals and then on normal humans, Dr. Ramirez reported "injecting 50% or 80% DMSO intramuscularly into patients with acute and chronic schizophrenia" and that "of the 14 acute cases, every single one was discharged from the hospital within 45 days after the start of DMSO treatment...

He said that 4 of the 11 chronic cases, one of whom has been ill for 14 years, were discharged eventually, and the other 7 improved a great deal and were given occupational therapy... He observed rapid decrease in agitation... recession of persecution feeling, a relatively sudden tendency to communicate and to stay clean.., the wane of obsessions, return to alertness, and a calmness where there had been restlessness and anxiety". Haley, 2000)

Genitourinary disorders

DMSO has been used in the treatment of a number of patients with various genitourinary disorders, including Peyronie's disease, interstitial cystitis, acute epididymitis. Some have obtained dramatic and gratifying relief of symptoms. Persky, Steeart, 1967).

Miscellaneous

DMSO in conjunction with other treatments has shown to regress cancer in a very effective way.
(Ayre, 1967).

Intravenous administration of DMSO markedly reduces pathological intestinal permeability while preserving the gut's absorption capacities (Wang et al, 1996). Considering that gut permeability ('leaky gut') has a fundamental role in chronic degenerative diseases, this is of great clinical importance.

DMSO also has excellent results in the skin of people afflicted with scleroderma, results which have never been observed with any other method of therapy. Scherbel et al, 1967).

Mrs. Jean Puccio of Washington, DC testified at hearings of Senator Edward Kennedy's sub-committee on health in 1980 on her recovery from scleroderma. Diagnosed in 1971, she was told that no medication would help, and that she would probably soon face a wheelchair and early death. By the time she found Dr. Jacob (through word of mouth), she told the Senators, "I was having difficulty breathing, walking, and eating".

The disease "thickens the tissue and makes your skin so tight you cannot move. It was difficult for me to drive, to turn the ignition in my car or turn my body". Her dentist could not work on her for awhile because she could not open her mouth.

"Now I can open my mouth like anybody", she said. After her sensitized skin burned from topical application of DMSO, Dr. Jacob suggested taking it orally. "Within six months", she testified, "my condition reversed almost immediately. I can do anything anybody else can do now". Haley, 2000).

Hopefully, this brief overview of DMSO's great capabilities has helped to illustrate how it is indeed, the cure of our times. I'm convinced of its therapeutic power, both by my own experience and that one of scores of people, not to mention the back-up of published scientific literature. Its uses and applications make it a very handy compound to have on your medical shelf. In pure form, the life of DMSO is indefinite, so it may be used for years.

Troubleshooting

The garlic-like body odor and taste in the mouth that some experience is attributable to a specific DMSO metabolite: dimethyl sulfide (DMS), a component of natural onion and garlic flavors.
(McKim, Strub, 2008).

This can last for one or two days and in a small number of people, especially men, the odor can be very pungent.Drinking enough water will help diffuse the smell.

Other side effects - such as stomach upset, headaches, dizziness, and sedation - are very likely related to detoxification reactions prompted by the DMSO.

Only purified and properly diluted DMSO should be used. When you dilute a pure DMSO solution, always do it in distilled water. When it is applied, the skin site as well as the applying hand should be thoroughly cleaned before application. This is of utmost importance as DMSO's properties allow contaminants to be absorbed through the skin and transported into the bloodstream.

DMSO is known to be one of the least toxic substances in biology (Parcell, 2002), so any serious side effects should come from potential contaminants or the intake of concomintant drugs that DMSO will carry into the body. Worth repeating again, DMSO and any substance dissolved in it, will penetrate the skin, the blood-brain barrier, and other parts of the body very fast.

Remember also that DMSO increases the effects of drugs like blood thinners, steroids, heart medicines, sedatives, etc. In addition to that, acetone or acid contamination of DMSO can lead to serious medical consequences.

Be aware of this problem when buying unreliable DMSO. A pure DMSO solution will turn solid (like ice) in the refrigerator within 2 hours. If, when the frozen bottle is turned upside down, little rivulets of water flow through the ice, you probably possess the veterinary grade DMSO. This is a 90% concentration. Ten percent is distilled water. (Morton, 1993).

Women are discouraged from using DMSO during pregnancy or breastfeeding, even though DMSO is used to preserve frozen human embryos. DMSO can interfere with liver function tests and give a false reading. That problem is easily solved by waiting a week after DMSO usage before taking the test.

Long-term use has been documented as safe. Eye damage, reported in laboratory animals, has not been confirmed. Side effects such as skin rash and itching after topical application, breaking up of blood elements after intravenous infusion, can be avoided in large part by employing more dilute solutions. Despite these side effects, DMSO is used as a preservative for blood elements and stem cells. (McKim, Strub, 2008).

When DMSO is diluted with water, heat is released. The bottle will be warm to the touch. This is a temporary, harmless reaction.

Since DMSO causes dryness and scaling of the outer layer of the skin, skin diseases characterized by scaling (psoriasis) could be aggravated by the use of DMSO. But DMSO applied topically for only a few days has been useful in psoriasis. Prolonged use of DMSO for the treatment of psoriasis is not advised however, as it can worsen the psoriatic condition (Engel, 1967), only DMSO taken orally is suggested.

"I'm happy to say that taking DMSO in conjunction with implementing the detoxification suggestions that were given is starting to take care of many of my remaining psoriasis problems. A couple areas are still being stubborn, but I've noticed a lot of general improvement. Using DMSO topically also helped improve a patch of eczema that my wife has been bothered by for quite a while". Peter Norquest, Tucson, Arizona, United States.

DMSO2, a derivative of DMSO, is better tolerated and doesn't have the odor and irritation side effects. Despite this positive aspect, it hasn't surpassed the effectiveness, fascination and popularity of DMSO. It is also known as methylsufonylmethane or MSM, an entire topic for another article by itself!

Sulfur is an element of the earth and it is essential to life, it is among the most prevalent elements in the human body. Allergic reactions to sulfur are not possible because sulfur has no protein component.

When people are 'allergic to sulfur', what they really mean is that they are allergic or sensitive mainly to certain sulfur-containing drugs or proteins, most notably sulfa antibiotics (sulfonamides) or to sulfites (preservatives used in wines and some foods), or to foods with a high sulfur content (broccoli, cauliflower, garlic, onions, etc). Many individuals with allergies to sulfa drugs, sulfites, or high sulfur containing foods (like the author) do not experience problems taking DMSO, because apart from sulfur, DMSO bears no relation to these Substances.

As always, proceed with caution, do your homework, and consult a health care provider in case of doubts.

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